Abstract

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Quantitation of Synthetic Cannabinoids in Plant Materials Using High Performance Liquid Chromatography with UV Detection (Validated Method).

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Abstract

Plant based products laced with synthetic cannabinoids have become popular substances of abuse over the last decade. Quantitative analysis for synthetic cannabinoid content in the laced materials is necessary for health hazard assessments addressing overall exposure and toxicity when the products are smoked. A validated, broadly applicable HPLC-UV method for the determination of synthetic cannabinoids in plant materials is presented, using acetonitrile extraction and separation on a commercial phenylhexyl stationary phase. UV detection provides excellent sensitivity with limits of quantitation (LOQs) less than 10 µg/g for many cannabinoids. The method was validated for several structural classes (dibenzopyrans, cyclohexylphenols, naphthoylindoles, benzoylindoles, phenylacetylindoles, tetramethylcyclopropylindoles) based on spike recovery experiments in multiple plant materials over a wide cannabinoid contents range (0.1-81 mg/g). Average recovery across 32 cannabinoids was 94% for marshmallow leaf, 95% for damiana leaf, and 92% for mullein leaf. The method was applied to a series of case-related products with determined amounts ranging from 0.2 to >100 mg/g.

KEYWORDS: forensic science; herbals; high performance liquid chromatography-ultraviolet detection; plant products; quantitative analysis; synthetic cannabinoids; synthetic cannabis; synthetic marijuana; validated method

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